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FIFTH QUARTERLY (TYPE II) PROGRESS REPORT

Project Title: Development of a Multi-disciplinary
ERTS User Program in the State of Ohio
Ref. 20900

Contract Number : NAS5-22399

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(E77-10045)   DEVELOPMENT OF A   N77-12475
MULTI-DISCIPLINARY ERTS USER PROGRAM IN THE
STATE OF OHIO   Quarterly Progress Report
(Ohio Dept. of Economic and Community) 5 p   Unclas
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Prepared for

GODDARD SPACE FLIGHT CENTER   *20900*
Greenbelt, Maryland 20771

Section A - Problems

1. Statewide Land Use Inventory - no problems

2. Socio-economic merging with LANDSAT data. This section of work is still waiting on results of the Statewide Land Use Inventory.

3. Services Development. The problems at this time are associated with the Economic Development Forestry Resource Management portion where small-scale aircraft coverage over the test site has not yet been satisfactorily accomplished ; also the Lake Erie Sedimentation study has some difficulties with the correlation of sedimentation ground observation data and the LANDSAT sedimentation patterns.

Section B - Accomplishments

1. Statewide Land Use Inventory - All of the geographic boundaries have been digitized at this point. In addition, the computer program to convert Bendix tape output format to OCAP format has been complete and debugged. Bendix has categorized the state as a whole and the only remaining task is to geometrically correct and map into the U.S.G.S. seven and one-half minute quadrangles.

2. Socio-economic merging with Landsat data. Accomplishment all stated in previous reports.

3. Service Development -

Urban Land Use Analysis:

Levels I and II land use information has been delineated from six frames of IR color transparencies which were taken by NASA over Columbus on August 12, 1975. Land use class information was transferred to black and white acetate topographic base maps at a scale of 1:24,000. The entire county is actually covered by 18 base maps, some showing only small areas at the edges or corners of the county with few land use categories. The major metropolitan area of Columbus, however, is covered by four quad sheets, covering

some 231 square miles (590 km)^2 of the 407-square mile county area.

Following the USGS land use classification system (with some modification), the following categories have been delineated:

1.1 Residential (single and multiple dwellings)

1.2 Commercial and services (shopping centers, warehouses, etc.)

1.3 Industrial (manufacturing plants)

1.4 Extractive (quarries)

1.5 Transportation (roads, railroads, airports)

1.6 Institutional (schools, churches, research institutes, hospitals, etc.)

1.7 Recreation, public and private (parks, golf courses, etc.)

1.8 Mixed

1.9 New construction

Each land use category has been color coded. Some difficulty has been experienced in the identification of industrial and commercial sites. Larger scale (1:40,000) imagery flown by NASA over Columbus in 1973 was used to differentiate between small industrial and commercial activities which could not be properly interpreted from the high-altitude data.

* All mineral surface mining and exploration:

Several overlays showing linear features derived from LANDSAT data have been completed. Several techniques were used to detect, trace, and code linears. Most analysis was done using a 200 line per inch Ronchi grating in conjunction with a projection system. More than 300 linears varying in length from 1 to 20 miles have been plotted on 1:250,000-scale maps of Ohio.

Section C - Significant Results

1. Statewide Land Use Inventory - None to report at this time.

2. Socio-economic merge - none to report at this time.

3. Service Development - Urban Land Use Analysis -

   A preliminary comparison of the land use maps derived from the high-
   altitude photography and imagery generated from land use CCT's at

   Battelle shows considerable correlation of both data. The degree of

   success of interpreting LANDSAT data, however, is directly related to the

   P.I.'s ability to correlate selected area samples recorded on high-

   altitude data. Some land use classes, however, such as areas covered by

   institutional and commercial features always require identification from

   data with a better resolution than obtainable with LANDSAT data.

   Most land use features are best identified on LANDSAT data taken over a

   full year, showing the effects of the four seasons. It thus appears

   that the most cost effective and timely way of providing land use data

   to end users is to use LANDSAT data for identifying 75 to 90 percent

   of all land use categories, using temporal data. The remainder of the

   urban area land users may then be interpreted using primarily high

   flight data and, in selected cases, conventional aircraft or reference

   data.

   All mineral surface mining and exploration -

   Close examination of LANDSAT, Skylab and aircraft data covering the same

   area where linears were found seems to indicate that the type of resolution

   characteristic of LANDSAT data results in a better definition of linears

   of 1 or more miles. Long-line linears have been found in the vicinity

   of known gas production areas in Ohio.

Section D - Publications

1. The Ohio Land Allocation Model: Report on Phase II by Oscar Fisch
    and Steven I. Gordon submitted to the Department of Economic and
    Community Development July, 1976.

Section E - Recommendations

1. None.